

CLAIM(S)

What is claimed is:

1. A method of Halftone Super-cell optimization for artifact reduction, comprising the steps of:
 - 5 receiving a halftone value;
 - selecting a group of super-cells, each super-cell having a plurality of sub-cells;
 - randomly selecting a code-value for each super-cell; and
 - biasing the sub-cells of each super-cell based on its randomly selected code-value;
 - wherein the total of the randomly selected code-value for the group of super-cells
 - 10 equals the halftone value.
2. The method of claim 1 wherein each super-cell has sub-cells growing in a pre-determined but different manner.
- 15 3. The method of claim 1 wherein the number of sub-cells per super-cell is selected from group consisting of 16, 64, and 128.
4. The method of claim 1 wherein the total of the randomly selected code-value for the group of super-cells is based on the average value of all the super-cells.
- 20 5. A method of Halftone Super-cell optimization for artifact reduction, comprising the steps of:
 - receiving a halftone value;
 - selecting a group of super-cells, each super-cell having a plurality of sub-cells;
 - 25 using a pattern to select sub-cells from each super-cell; and
 - biasing the selected group of sub-cells;
 - wherein the total of the selected group of sub-cells for the group of super-cells equals the halftone value.

6. The method of claim 5 wherein each super-cell has a different pattern for selecting sub-cells than all adjacent super-cells.

7. The method of claim 5 wherein the number of sub-cells per super-cell is
5 selected from group consisting of 16, 64, and 128.

8. The method of claim 1 wherein the pattern is selected from the group consisting of a sine wave and a square wave.

10 9. A method of Halftone Super-cell optimization for artifact reduction, comprising the steps of:
receiving a halftone value;
selecting a group of super-cells, each super-cell having a plurality of sub-cells;
grouping sub-cells such that at least one group of sub-cells contains cells from at least
15 two super-cells;
randomly selecting sub-cells based on a code value for each super-cell; and
biasing each grouping of sub-cells based on its randomly selected code-value;
wherein the total of the selected group of sub-cells for the group of super-cells equals the halftone value.

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10. The method of claim 10 wherein each grouping of sub-cells has a different code-value than all adjacent groupings of super-cells.

11. The method of claim 9 wherein the randomly selected group of sub-cells are
25 selected based on a predetermined pattern.

12. The method of claim 11 wherein the overall pattern of growth within a group of sub-cells can differ in each individual sub-cell.

13. An image output apparatus, comprising:
means adapted to receive a halftone value;
means adapted to select a group of super-cells, each super-cell having a plurality of
sub-cells;
5 means adapted to randomly select a code-value for each super-cell; and
means adapted to bias the sub-cells of each super-cell based on its randomly selected
code-value;
wherein the total of the randomly selected for the group of super-cells equals the
halftone value.

10 14. The image output apparatus of claim 13 wherein each super-cell has a different
number of randomly selected sub-cells than all adjacent super-cells.

15 15. An image output apparatus, comprising:
means adapted to receive a halftone value;
means adapted to select a group of super-cells, each super-cell having a plurality of
sub-cells;
means adapted to use a pattern to select sub-cells from each super-cell; and
means adapted to bias the selected group of sub-cells;
20 wherein the total of the selected group of sub-cells for the group of super-cells equals
the halftone value.

25 16. The image output apparatus of claim 15 wherein each super-cell has a different
pattern for selecting sub-cells than all adjacent super-cells.

17. The image output apparatus of claim 15 wherein the pattern is selected from
the group consisting of a square wave, a sine wave, a crossing pattern, a vertical pattern and a
horizontal pattern.

18. A image output apparatus, comprising:
means adapted to receive a halftone value;
means adapted to select a group of super-cells, each super-cell having a plurality of
sub-cells;

5 means adapted to group sub-cells such that at least one group of sub-cells contains
cells from at least two super-cells;

means adapted to randomly select a group of sub-cells from each grouping of sub-
cells; and

means adapted to bias the randomly selected group of sub-cells;

10 wherein the total of the selected group of sub-cells for the group of super-cells equals
the halftone value.

19. The image output apparatus of claim 18 wherein each grouping of sub-cells has
a different number of randomly selected sub-cells than all adjacent groupings of super-cells.

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20. The image output apparatus of claim 18 wherein the randomly selected group
of sub-cells are selected based on a predetermined pattern.

21. The image output apparatus of claim 20 wherein the predetermined pattern for
20 each grouping of sub-cells is selected from the group consisting of a square wave and a sine
wave.

22. A computer program product having a computer readable medium having
computer program logic recorded thereon for halftone super-cell optimization for artifact
25 reduction, comprising:

means adapted to receive a halftone value;

means adapted to select a group of super-cells, each super-cell having a plurality of
sub-cells;

means adapted to randomly select a group of sub-cells from each super-cell; and

means adapted to bias the randomly selected group of sub-cells;
wherein the total of the selected group of sub-cells for the group of super-cells equals the halftone value.

5 23. The computer program product of instructions of claim 22 wherein each super-cell has a different number of randomly selected sub-cells than all adjacent super-cells.

 24. A computer program product having a computer readable medium having computer program logic recorded thereon for halftone super-cell optimization for artifact
10 reduction, comprising

 means adapted to receive a halftone value;

 means adapted to select a group of super-cells, each super-cell having a plurality of sub-cells;

 means adapted to use a pattern to select sub-cells from each super-cell; and

15 means adapted to bias the selected group of sub-cells;

 wherein the total of the selected group of sub-cells for the group of super-cells equals the halftone value.

 25. The computer program product of instructions of claim 24 wherein each super-
20 cell has a different pattern for selecting sub-cells than all adjacent super-cells.

 26. The computer program product of instructions of claim 24 wherein the pattern is selected from the group consisting of a square wave, a sine wave, a crossing pattern, a vertical pattern and a horizontal pattern.

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 27. A computer program product having a computer readable medium having computer program logic recorded thereon for halftone super-cell optimization for artifact reduction, comprising:

 means adapted to receive a halftone value;

means adapted to select a group of super-cells, each super-cell having a plurality of sub-cells;

means adapted to group sub-cells such that at least one group of sub-cells contains cells from at least two super-cells;

5 means adapted to randomly select a group of sub-cells from each grouping of sub-cells; and

means adapted to bias the randomly selected group of sub-cells;

wherein the total of the selected group of sub-cells for the group of super-cells equals the halftone value.

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28. The computer readable medium of instructions of claim 27 wherein each grouping of sub-cells has a different number of randomly selected sub-cells than all adjacent groupings of super-cells.

15 29. The computer readable medium of instructions of claim 27 wherein the randomly selected group of sub-cells are selected based on a predetermined pattern.

30. The computer readable medium of instructions of claim 29 wherein the predetermined pattern for each grouping of sub-cells is selected from the group consisting of a
20 square wave and a sine wave.